

ABSTRACT OF THE DISCLOSURE

A process of making an electric current rectifying device using spatially coupled bipolar electrochemical deposition includes (a) placing at least two electrically conductive substrates, which may be a source of electrically conductive material, or a separate source of electrically conductive material, together with at least one semiconductor into an environment capable of conducting electricity and containing electrodes; (b) aligning the substrates and the semiconductor with respect to the electrodes such that the electrodes are not in contact with the substrates or the semiconductor and such that the material will form a conductive structure between and in contact with the substrates and the semiconductor when an electric field is applied between the electrodes;

(c) applying a voltage ~~to the electrodes to create a first electric field of a sufficient strength between the electrodes and for a time sufficient~~ to form a first electrically conductive structure between and in contact with a first of the substrates and the semiconductor, ~~the electrically conductive structure being substantially aligned with the first electric field;~~ (d) reversing the polarity of the voltage ~~applied to create a second electric field of a sufficient strength between the electrodes and for a time sufficient~~ to form a second electrically conductive structure ~~between and in contact with a second of the substrates and the semiconductor, the electrically conductive structure being substantially aligned with the second electric field;~~ the semiconductor thus being transformed into the rectifying device.